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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BRIAN K. GUENTER and NEEL S. JOSHI

Appeal 2016-005908
Application 13/720,872
Technology Center 2600

Before JEFFREY S. SMITH, JEREMY J. CURCURI, and
JON M. JURGOVAN, *Administrative Patent Judges*.

CURCURI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1–20. Non-Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

Claims 1–6, 8–10, and 12–20 are rejected under 35 U.S.C. § 103(a) as obvious over Ito (US 7,626,621 B2; issued Dec. 1, 2009) and Wenstrand (US 7,598,996 B2; issued Oct. 6, 2009). Non-Final Act. 3–7.

Claim 11 is rejected under 35 U.S.C. § 103(a) as obvious over Ito, Wenstrand, and Hong (US 2008/0081396 A1; issued Apr. 3, 2008). Non-Final. Act. 8.

Claim 7 is rejected under 35 U.S.C. § 103(a) as obvious over Ito, Wenstrand, and Gerald (US 6,774,635 B1; issued Aug. 10, 2004). Non-Final Act. 8–9.

We affirm.

STATEMENT OF THE CASE

Appellants' invention relates to "an image sensor that is controllable curved to adapt for differences in lens focal lengths." Abstract. Claim 1 is illustrative and reproduced below:

1. A system comprising, a sensor configured to capture first image data received through a camera lens, the sensor further configured to be automatically curved by a curve controller, based upon feedback data corresponding to the captured first image data, the feedback data being used to increase image quality of second image data.

ANALYSIS

THE OBVIOUSNESS REJECTION OF CLAIMS 1–6, 8–10, AND 12–20 OVER ITO AND WENSTRAND

The Examiner finds Ito and Wenstrand teach all limitations of claim 1. Non-Final Act. 3–4.

Appellants present the following principal arguments:

i. "Wenstrand merely determines whether ***the position of the lens*** needs to be adjusted in contrast to describing ***curving the sensor*** as enabled by independent Claim 1." App. Br. 9.

ii. "[W]hen the image quality data in Wenstrand for changing the position of the lens is applied to the system of Ito, the system of Ito would not be operable because translational data of a lens cannot be used to change the curvature of the sensor described in Ito." App. Br. 9; *see also* Reply Br. 1–7.

We do not see any error in the contested findings of the Examiner. We concur with the Examiner's legal conclusion of obviousness.

Regarding Appellants' argument (i),

> [t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.

In re Keller, 642 F.2d 413, 425 (CCPA 1981) (citations omitted).

The Examiner finds Ito and Wenstrand, collectively, teach curving the sensor as set forth in claim 1. The Examiner finds Ito teaches all limitations of claim 1, except for "Ito does not disclose adjusting curvature *based upon feedback data corresponding to the captured first image data to increase image quality of second image data*." Non-Final Act. 3 (emphasis added); *see also* Ito Abstract ("a curvature changing portion which changes a curvature of the solid-state image pickup element"). The Examiner finds "Wenstrand discloses adjusting a focus quality of a second image to be captured based upon feedback data corresponding to the captured first image data." Non-Final Act. 3 (citing Wenstrand col. 6, l. 42; col. 7, ll. 2–7; Abstract); *see also* Wenstrand Abstract ("determining whether a position of a lens from the image sensor within the digital camera module should be altered to improve a focus quality of subsequently captured images"). We agree with and adopt these findings as our own. The Examiner reasons:

> At the time of invention, it would have been obvious for a person of ordinary skill in the art to utilize feedback data corresponding to the captured first image data as disclosed by Wenstrand to adjust image sensor as disclosed by Ito in order to improve focus quality of subsequently captured images more accurately by figuring out how much adjustment needs to be done through the test image data.

Non-Final Act. 4; *see also* Ans. 14–16. We agree with and adopt this reasoning as our own. We concur with the Examiner's conclusion.

In more detail, when Wenstrand's teaching (Wenstrand Abstract) of adjusting the position of the lens with respect to the image sensor based upon feedback data corresponding to captured image data is combined with Ito's teaching (Ito Abstract) of changing curvature of the image sensor, modifying Ito's system such that the image sensor's curvature is changed (thereby further changing the position of the image sensor with respect to the lens) based upon feedback data corresponding to captured image data would have been a predictable use of prior art elements according to their established functions—an obvious improvement. As the U.S. Supreme Court has explained:

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* [*v. Ag Pro, Inc.*, 425 U.S. 273 (1976)] and *Anderson's-Black Rock*[, *Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969)] are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

KSR Int'l Co. v. Teleflex, Inc., 550 U.S. 398, 417 (2007).

Further, regarding Appellants' argument (ii), the combined teachings of the references do not require using translational data of a lens to change the curvature of the image sensor of Ito; rather, as discussed above, a skilled artisan would have understood, in light of the collective teachings of the

references, that adjustment based upon feedback data corresponding to captured image data could be made via adjusting the lens (*see* Wenstrand Abstract) and further made via adjusting the sensor curvature (thereby further changing the position of the image sensor with respect to the lens) (*see* Ito Abstract). *See* Ans. 14–16.

We, therefore, sustain the Examiner's rejection of claim 1, as well as claims 2–6 and 8–10, which are not separately argued with particularity.

Regarding claim 12, Appellants present the same principal arguments as presented with respect to claim 1. *See* App. Br. 10–11. Thus, for reasons discussed above, we do not see any error in the contested findings of the Examiner nor do we see any error in the Examiner's legal conclusion of obviousness.

We, therefore, sustain the Examiner's rejection of claim 12, as well as claims 13–15, which are not separately argued with particularity.

Regarding claim 16, this claim recites, in pertinent part with added emphasis, "using the focal length data to coarsely adjust the sensor curvature, and using the image quality data to finely adjust the sensor curvature by *iterating over image data obtained from a plurality of captured images*."

Appellants argue that the curvature in Ito, once set, is fixed. *See* App. Br. 11–12.

We do not see any error in the contested findings of the Examiner nor do we see any error in the Examiner's legal conclusion of obviousness. *See* Final Act. 6, Ans. 17–18.

In reaching our decision, we emphasize that a skilled artisan would have understood, in light of the collective teachings of the references, that

adjustment based upon feedback data corresponding to captured image data could be made via adjusting the lens translationally (*see* Wenstrand Abstract) and further made via adjusting the sensor curvature (thereby further changing the position of the image sensor with respect to the lens) (*see* Ito Abstract). *See also* Ito col. 29, ll. 4–5 ("the curvature of CCD 2 may be adjusted in accordance with the distance information obtained by the AF sensor 340.") *and* Wenstrand col. 8, ll. 24–41 (*iterative* process for focus optimization).

Thus, Ito and Wenstrand collectively teach "using the focal length data to coarsely adjust the sensor curvature," (*see* Ito Abstract; col. 29, ll. 4–5) "and using the image quality data to finely adjust the sensor curvature by iterating over image data obtained from a plurality of captured images" (*see* Wenstrand Abstract; col. 8, ll. 24–41; Ito Abstract).

We, therefore, sustain the Examiner's rejection of claim 16.

Regarding claim 17, Appellants present the same principal arguments as presented with respect to claim 1. *See* App. Br. 12–13. Thus, for reasons discussed above, we do not see any error in the contested findings of the Examiner nor do we see any error in the Examiner's legal conclusion of obviousness.

We, therefore, sustain the Examiner's rejection of claim 17, as well as claims 18–20, which are not separately argued with particularity.

THE OBVIOUSNESS REJECTION OF CLAIM 11 OVER ITO, WENSTRAND, AND HONG

The Examiner finds Ito, Wenstrand, and Hong teach all limitations of claim 11. Non-Final Act. 8.

Appellants argue Hong fails to overcome the purported deficiencies of Ito and Wenstrand. *See* App. Br. 13–14.

For reasons explained above when addressing claim 1, we, therefore, sustain the Examiner's rejection of claim 11.

THE OBVIOUSNESS REJECTION OF CLAIM 7 OVER ITO, WENSTRAND, AND GERALD

The Examiner finds Ito, Wenstrand, and Gerald teach all limitations of claim 7. Non-Final Act. 8–9.

Appellants argue Gerald fails to overcome the purported deficiencies of Ito and Wenstrand. *See* App. Br. 13–14.

For reasons explained above when addressing claim 1, we, therefore, sustain the Examiner's rejection of claim 7.

ORDER

The Examiner's decision rejecting claims 1–20 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED